

# PATENT COOPERATION TREATY

REC'D 19 APR 2005

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From the  
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/IB2005/050260

International filing date (day/month/year)  
22.01.2005

Priority date (day/month/year)  
23.01.2004

International Patent Classification (IPC) or both national classification and IPC  
G02B6/122, G02B6/43, H01S5/02

Applicant  
KONINKLIJKE PHILIPS ELECTRONICS, N.V.

### 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

### 3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/IB2005/050260

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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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**Box No. II Priority**

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1. ☒ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43*bis*.1 and 64.1) is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/IB2005/050260

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	2-9,11-14,16-23
	No: Claims	1,10,15
Inventive step (IS)	Yes: Claims	--
	No: Claims	1-23
Industrial applicability (IA)	Yes: Claims	1-23
	No: Claims	--

2. Citations and explanations

see separate sheet

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**Box No. VI Certain documents cited**

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1. Certain published documents (Rules 43bis.1 and 70.10)

and /or

2. Non-written disclosures (Rules 43bis.1 and 70.9)

see form 210

**Re Item V.**

**1 Reference is made to the following documents:**

D1: WO 03/042741 A (COMMISSARIAT A L'ENERGIE ATOMIQUE)  
22 May 2003

& US 2004/0252931, 16 December 2004

D2: US-A-5 710 441 (ACKLEY ET AL) 20 January 1998

D3: US-A-5 987 208 (GRUENING ET AL) 16 November 1999,  
cited in the application

D4: BARDONNIE DE LA M ET AL: "ON THE AGING OF AVALANCHE LIGHT  
EMISSION FROM SILICON JUNCTIONS" IEEE TRANSACTIONS ON ELECTRON  
DEVICES, vol. 46, no. 6, June 1999, pages 1234-1239

**2 INDEPENDENT CLAIMS 1, 10, AND 15**

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1, 10, and 15 is not new in the sense of Article 33(2) PCT.

2.2 Document D1 discloses (the references in parentheses applying to this document; for convenience, the citations of passages refer to the English translation in the later published US patent application):

an integrated optical network device comprising (see figure 9)

- an active optical element (91), in particular a semiconductor light source (paragraph 26) mounted in a cavity (92) in a silicon substrate (73-75), wherein the semiconductor light source is fabricated from a non-silicon material (paragraph 74); and
- an optical waveguide (70) for the photons emitted by the semiconductor light source.

According to D1, paragraphs 37-47, the waveguide may consist of a silicon guide

surrounded by SiO<sub>2</sub> insulator regions (figure 1, ref. 11; figure 9, (72)) or, alternatively, by a silicon guide surrounded by photonic bandgap structures (30) which are etched directly into the silicon substrate. The device of claim 1, and the corresponding method of claim 10, are therefore not new.

- 2.3 The document D1 further refers to integrated circuits comprising optical interconnects, i.e. waveguides between semiconductor light sources and receiving devices, as one application of the disclosed devices (paragraph 5). The subject-matter of claim 15 is therefore also not new.

**3 DEPENDENT CLAIMS 2-9, 11-14, 16-23**

Dependent claims 2-9, 11-14, and 16-23 do not contain any features which, in combination with the features of the independent claims 1, 10, and 15 to which they refer, meet the requirements of the PCT in respect of inventive step (Article 33(3) PCT), for the following reasons:

- claims 2, 3, 18, 19: it is obvious to cover the semiconductor light source with a reflective surface comprising an optical window, as e.g. disclosed in D2, figure 1.
- claims 4, 5, 13, 20: it is obvious to realise the photonic bandgap structures disclosed in D1 as a plurality of porous columns arranged to define a channel, as e.g. disclosed in D3, figures 1 and 2.
- claims 6, 16: it is obvious for the skilled person to incorporate a control system to regulate the emission of light of the semiconductor light source.
- claims 7, 8, 11, 12, 21, 22 specify choices of well known materials for the semiconductor and the substrate, which the skilled person would obviously consider.
- claims 9, 14, 17, 23: D1 refers to "active optical elements" and "sources" in general (D1, paragraph 26). The skilled person would obviously consider bipolar transistors as light sources for such an application, as e.g. suggested in the introduction of D4, and photo diodes as receiving devices.